

REMARKS

Summary of Amendments

1. Claims 1-9 were originally presented in this application. Claims 10-16 were added in a preliminary amendment dated December 29, 2004. Claims 1 and 2 have been amended, as described in more detail below, to more particularly point out and distinctly claim the subject matter of the instant invention. In turn, claims 3 and 10 have been amended for editorial clarity following on the amendments to claims 1 and 2. Claims 1-16 remain pending.

Claim Rejections – 35 U.S.C. § 102

2. Claims 1, 2, 4, 5, 8, and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by *Nagai* (EP 1378934). In particular, regarding claim 1, the Examiner states:

Nagai discloses a method of manufacturing a group III-V crystal... comprising: a step of depositing a metal film on a substrate..., a step of heat-treating the metal film under an atmosphere in which a patterning compound is present..., and a step of growing III-V compound crystal on the metal film.

Regarding claim 2, the Examiner states

Nagai discloses a method... comprising: a step of depositing a metal film on a substrate..., a step of heat-treating the metal film under an atmosphere in which a patterning compound is present..., a step of growing a III-V buffer film 32 on the metal film..., and a step of growing a group III-V crystal 203 on the buffer film."

3. Claims 1 and 2 also stand rejected under 35 U.S.C. § 102(b) as also being anticipated by Japanese Unexamined Pat. App. Pub. No. 2000-164988 (App. No. H10-335851). In particular, regarding claim 1, the Examiner states

Japan Application No. 10335851 discloses a method of manufacturing a group III-V crystal... comprising: a step of depositing a metal film on a substrate..., a step of heat-treating the metal film under an atmosphere in which a patterning compound is present..., and a step of growing a group III-V compound crystal on the metal film.

Regarding claim 2, the Examiner states

Japan Application No. 10335851 discloses a method of manufacturing a group III-V crystal... comprising: a step of depositing a metal film on a substrate..., a step of heat-treating the metal film under an atmosphere in which a patterning compound is present..., and a step of growing a buffer layer and then a group III-V compound crystal on the substrate.

4. Applicants respectfully traverse these rejections to the extent that they are pertinent to independent claims 1 and 2 as amended herein. As currently amended, claims 1 and 2 now each recite: "a heat-treatment step of heat-treating the metal film under an atmosphere in which a metal-film patterning compound is present so that the metal film becomes patterned with a plurality of holes or grooves having an indefinite shape." The amendments to claims 1 and 2 are supported by original Figs. 3A and 3B. (No new matter has been added, and no new search should be required.) The amendments to claims 1 and 2 are also supported throughout the original specification—for example, by page 4, lines 18-20, which states that according to the present invention: "holes or grooves in a worm-eaten pattern... [are] formed in the metal film by heat-treating the metal film under an atmosphere in which a patterning compound is present."
5. Applicants respectfully submit that independent claims 1 and 2 distinguish patentably over the prior art of record. In particular, there is nothing in either *Nagai* or Japanese Pat. App. No. H10-225851 that discloses a step of heat-treating a metal film under an atmosphere in which a metal-film patterning compound is present so that the metal film becomes patterned with a plurality of holes or grooves of an indefinite shape.
6. *Nagai*, on the contrary, discloses a production method for a III-nitride compound semiconductor in which first **41m** and second **42m** masks are formed on a substrate to promote vertical growth of a subsequently grown GaN layer (abstract). *Nagai* is representative of the prior art (see the Background section of the original specification), in that the first and second masks are formed using conventional photolithography techniques (*Nagai*, col. 5, col. 8, and col. 13, lines 1-7). Moreover, the masks are formed in a highly regular, definite, repeating pattern (see Figs 1A-1F therein). This is in contradistinction to amended claims 1 and 2, which, as described above, recite a heat-treatment step in which a plurality of holes or grooves having an indefinite shape are formed in the metal film. As also described in the original specification, the present invention, as recited in amended claims 1 and 2, advantageously provides a simple, low-cost manufacturing method for producing high-quality group III-V crystals. The method also advantageously obviates the need for expensive photolithography techniques (such as those utilized by *Nagai*). Applicants therefore submit that claims 1 and 2 are patentable over *Nagai*.

7. Japanese Pat. App. No. H10-225851 also discloses a method for growing nitride-based III-V compound semiconductors. Japanese Pat. App. No. H10-225851 is similar to *Nagai* in that a mask having a highly regular, repeating pattern of lines (cf. Figs. 3 and 4 therein) is formed on a substrate. The mask is presumably formed by prior art photolithography techniques, such as those described in *Nagai*. As described above, this is in clear distinction to the indefinitely shaped holes or grooves resulting in a metal film patterned by the heat-treatment step as now recited in claims 1 and 2. Applicants therefore submit that claims 1 and 2 are patentable over Japanese Pat. App. No. H10-225851.
8. Applicants therefore submit that independent claims 1 and 2 are allowable over the prior art of record. Claims 1 and 2 being allowable, it follows that claims 3-9 (which depend from claim 1) and claims 10-16 (which depend from claim 2) are also allowable.

Claim Rejections – 35 U.S.C. § 103

9. Claims 3, 6, and 7 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Nagai*. Applicants respectfully submit that this rejection is moot in view of the remarks set forth above in Sections 4, 5, and 6.

Accordingly, Applicants courteously urge that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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